CLAIMS

(1) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said data packets is Dmax,

fragmenting a data part extracted from a data field of one data frame to be transmitted, to generate X data blocks that have data fields equal to or smaller than Dmax and a same packet time length, the packet time length being data size or transmission time; and

generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(2) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said respective transmission media is a reference transmission rate,

setting a maximum data size of said X data packets to a value obtained by (Dmax × a transmission rate of a corresponding line/the reference transmission rate);

fragmenting a data part extracted from a data field of one data frame to be transmitted in accordance with transmission rates of respective lines to generate X data blocks that have data fields equal to or smaller than the maximum data size of the respective lines and a same packet time length, the packet time length being transmission time; and

generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(3) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said X data packets is Dmax,

generating X data blocks that have data fields equal to or smaller than Dmax and a same packet time length by connecting and dividing data parts extracted from data fields of a plurality of data frames to be transmitted, the packet time length being data size or transmission time; and

generating X data packets by adding, to each of said X data blocks, a main header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(4) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said respective transmission media is a reference transmission rate,

setting a maximum data size of said X data packets to a value obtained by (Dmax × a transmission rate of a corresponding line/the reference transmission rate);

generating X data blocks having data fields equal to or smaller than the maximum data size of respective lines and a same packet time by connecting data parts extracted from data fields of a plurality of data frames to be transmitted and dividing the connected data parts in accordance with transmission rates of the respective lines, the packet time length being transmission time; and

generating X data packets by adding, to each of said X data blocks, a main header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(5) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when transmission rates of respective transmission media for transmitting said X

data packets simultaneously are the same and a maximum data size of said X data packets is Dmax,

generating X data series having data fields equal to or smaller than Dmax by aggregating data parts extracted from data fields of a plurality of data frames to be transmitted;

generating X data blocks having a same packet time length by adding dummy data to data series of said X data series except one having a largest data size, the packet time length being data size or transmission time; and

generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(6) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said respective transmission media is a reference transmission rate,

setting a maximum data size of said X data packets to a value obtained by (Dmax × a transmission rate of a corresponding line/the reference transmission rate);

generating X data series having data fields equal to or smaller than the maximum data size in each line by aggregating data parts extracted from data fields of a plurality of data frames to be transmitted;

generating X data blocks having a same packet time length by adding dummy data to data series of said X data series except one having a largest packet time length, the packet time length being transmission time; and

generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(7) The wireless packet communication method according to any one of Claims 1, 3, and 5, characterized in that

in a case where it is possible to independently set the transmission rates of the respective transmission media for transmitting said X data packets simultaneously, the transmission rates of said respective transmission media are set to be a same rate as a smallest one of the transmission rates.

(8) The wireless packet communication method according to Claim 5, characterized in that

the data series are generated by accepting data frames to be transmitted in order and assigning the data frames to said respective transmission media until a total data size reaches a largest size not exceeding the maximum data size Dmax.

(9) The wireless packet communication method according to Claim 5, characterized in that

the data series are generated by accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame until a total data size media reaches a largest size not exceeding the maximum data size Dmax.

(10) The wireless packet communication method according to Claim 5, characterized in that

the data series are generated by accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame such that a next data frame is assigned to one of said transmission media that has a smallest data size of assigned data frames until a total data size reaches a largest size not exceeding the maximum data size Dmax.

(11) The wireless packet communication method according to Claim 5, characterized in that

the data series are generated by employing one of the methods recited in claims 8 to 10 so that a total number of accommodated data frames is to be a maximum.

(12) The wireless packet communication method according to Claim 6, characterized in that

the data series are generated by accepting data frames to be transmitted in order and assigning one data frame to each of said respective transmission media until a total data size reaches a largest size not exceeding maximum data sizes corresponding to said transmission media.

(13) The wireless packet communication method according to Claim 6, characterized in that

the data series are generated by accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame until a total data size reaches a largest size not exceeding maximum data sizes corresponding to said transmission media .

(14) The wireless packet communication method according to Claim 6, characterized in that

the data series are generated by accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame such that a next data frame is assigned to one of said transmission media

that has a smallest data size of assigned data frames until a total data size reaches a largest size not exceeding maximum data sizes corresponding to said transmission media.

(15) The wireless packet communication method according to Claim 6, characterized in that

the data series are generated by employing one of the methods recited in claims 12 to 14 so that a total number of accommodated data frames is to be a maximum.

(16) The wireless packet communication method according to Claim 5 or 6, characterized in that

said data series are generated to contain sub-headers for identifying said data frames, respectively.

(17) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said data packets is Dmax,

generating the X data packets by the method recited in claim 1, in a case where a number of data frames to be transmitted is 1;

generating the X data packets by the method recited in claim 3 or 5, in a case where a number of data frames to be transmitted is 2 or more and it is possible to generate data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 3 or the aggregation as recited in claim 5; and

generating the X data packets by the method recited in claim 1, in a case where a number of data frames to be transmitted is 2 or more and it is impossible to generate the

data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 3 or the aggregation as recited in claim 5.

(18) A wireless packet communication method for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication method characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates is a reference transmission rate,

setting a maximum data size of said X data packets to a value by obtained (Dmax × a transmission rate of a corresponding line/the reference transmission rate);

generating the X data packets by the method recited in claim 2, in a case where a number of data frames to be transmitted is 1;

generating the X data packets by the method recited in claim 4 or 6, in a case where a number of data frames to be transmitted is 2 or more and it is possible to generate data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 4 or the aggregation as recited in claim 6; and

generating the X data packets by the method recited in claim 2, in a case where a number of data frames to be transmitted is 2 or more and it is impossible to generate the data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 4 or the aggregation as recited in claim 6.

(19) The wireless packet communication method according to Claim 1 or 2, characterized in that

X data packets generated after the simultaneous transmission of the X data packets

are transmitted continuously without performing carrier sense, until a time corresponding to a transmission time of data packets generated from said one data frame before fragmentation passes.

(20) The wireless packet communication method according to Claim 1 or 2, characterized in that

X data packets generated after the simultaneous transmission of the X data packets are transmitted consecutively X times without performing carrier sense.

(21) The wireless packet communication method according to any one of Claims 1 to 6, characterized by further comprising:

when one of said two STAs is an AP and the other is a mobile terminal,

selecting data frames from data frames addressed to a same mobile terminal in a transmission buffer of said AP within a range in which the selected data frames are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing data frames transmitted to said mobile terminal from a device connected to said AP;

adding a source address of the device connected to said AP to each of frame bodies of the selected data frames and connecting the frame bodies;

generating said X data packets by adding a MAC header to each of data blocks obtained by dividing the connected frame bodies by a number of simultaneous transmissions; and

transmitting said X data packets simultaneously.

(22) The wireless communication method according to any one of Claims 1 to 6, characterized by further comprising:

when one of said two STAs is an AP and the other is a mobile terminal,

selecting IP packets from IP packets addressed to a same AP in a transmission buffer of said mobile terminal within a range in which the selected IP packets are able to be

accommodated in data packets to be transmitted simultaneously, the transmission buffer storing IP packets to be transmitted to a device connected to said AP;

adding a destination address of the device connected to said AP to each of the selected IP packets and connecting the IP packets;

generating said X data packets by adding a MAC header to each of data blocks obtained by dividing the connected frame bodies by a number of simultaneous transmissions; and

transmitting said X data packets simultaneously.

(23) The wireless packet communication method according to any one of Claims 1 to 6, characterized by further comprising:

when one of said two APs is an AP and the other is a mobile terminal,

selecting and aggregating data frames from data frames addressed to a same mobile terminal in a transmission buffer of said AP within a range in which the selected data frames are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing data frames transmitted to said mobile terminal from a device connected to said AP;

adding a source address of the device connected to said AP to each of frame bodies of the selected data frames and further adding a MAC header to each of the frame bodies of the selected data frames to generate said X data packets; and

transmitting said X data packets simultaneously.

(24) The wireless packet communication method according to any one of Claims 1 to 6, characterized by further comprising:

when one of said two STAs is an AP and the other is a mobile terminal,

selecting and aggregating IP packets from IP packets addressed to a same AP in a transmission buffer of said mobile terminal within a range in which the selected IP packets

are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing IP packets to be transmitted to a device connected to said AP;

adding a destination address of the device connected to said AP to each of the selected IP packets and further adding a MAC header to each of the selected IP packets to generate said X data packets; and

transmitting said X data packets simultaneously.

(25) The wireless packet communication method according to any one of Claims 1 to 6, characterized in that

when one of said two STAs transfers data frames accumulated in a transmission buffer to the other STA, for data frames addressed to the other STA, the one STA generates data packets by the method recited in any one of claims 21 to 24 and transmits the data packets in one lump or simultaneously.

(26) The wireless packet communication method according to any one of Claims 1 to 6, characterized in that:

a communication device is connected to each of said two STAs; and

when one of said two STAs transfers data frames that are accumulated in a transmission buffer and are transmitted from a source device connected to the one STA to a destination device connected to the other STA, for data frames addressed to the other STA, the one STA generates data packets by the method recited in any one of claims 21 to 24 and transmits the data packets in one lump or simultaneously.

(27) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said data packets is Dmax,

a unit generating X data blocks that have data fields equal to or smaller than Dmax and a same packet time length by fragmenting a data part extracted from a data field of one data frame to be transmitted, the packet time length being data size or transmission time; and

a unit generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit said X data packets simultaneously.

(28) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said respective transmission media is a reference transmission rate,

a unit setting a maximum data size of said X data packets to a value obtained by (Dmax × a transmission rate of a corresponding line/the reference transmission rate);

a unit generating X data blocks that have data fields equal to or smaller than the maximum data size of each line and a same packet time length by fragmenting a data part extracted from a data field of one data frame to be transmitted in accordance with transmission rates of respective lines, the packet time length being transmission time; and

a unit generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(29) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said data packets is Dmax,

a unit generating X data blocks that have data fields equal to or smaller than Dmax and a same packet time length by connecting and dividing data parts extracted from data fields of a plurality of data frames to be transmitted, the packet time length being data size or transmission time; and

a unit generating X data packets by adding, to each of said X data blocks, a main header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(30) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest

one of the transmission rates of said respective transmission media is a reference transmission rate,

a unit setting a maximum data size of said X data packets to a value obtained by (Dmax × a transmission rate of a corresponding line/a reference transmission rate);

a unit generating X data blocks that have data fields equal to or smaller than the maximum data size of each line and a same packet time length by connecting data parts extracted from data fields of a plurality of data frames to be transmitted and dividing the connected data parts in accordance with transmission rates of respective lines, the packet time length being transmission time; and

a unit generating X data packets by adding, to each of said X data blocks, a main header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(31) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said data packets is Dmax,

a unit generating X data series having data fields equal to or smaller than Dmax by aggregating data parts extracted from data fields of a plurality of data frames to be transmitted;

a unit generating X data blocks having a same packet time length by adding dummy data to a data series of said X data series except one having a largest size, the

packet time length data size or transmission time; and

a unit generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(32) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when it is possible to independently set transmission rates of respective transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said transmission media is a reference transmission rate,

a unit setting a maximum data size of said X data packets to a value obtained by (Dmax × a transmission rate of a corresponding line/the reference transmission rate);

a unit generating X data series having data fields equal to or smaller than the maximum data size of each line by aggregating data parts extracted from data fields of a plurality of data frames to be transmitted;

a unit generating X data blocks having a same packet time length by adding dummy data to a data series of said X data series except one having a largest packet time length, the packet time length being transmission time; and

a unit generating X data packets by adding, to each of said X data blocks, a header field containing control information such as destination information and an FCS field containing an error checking code, to transmit the X data packets simultaneously.

(33) The wireless packet communication apparatus according to any one of Claims 27, 29, and 31, characterized by further comprising

a unit, in a case where it is possible to independently set the transmission rates of the transmission media for transmitting said X data packets simultaneously, setting the transmission rates of said transmission media to a smallest one of the transmission rates.

(34) The wireless packet communication apparatus according to Claim 31, characterized by further comprising

a unit accepting data frames to be transmitted in order and assigning the data frames to said transmission media until a total data size reaches a largest size not exceeding the maximum data size Dmax, thereby generating the data series.

(35) The wireless packet communication apparatus according to claim 31, characterized by further comprising

a unit accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame until a total data size reaches a largest size not exceeding the maximum data size Dmax, thereby generating the data series.

(36) The wireless packet communication apparatus according to Claim 31, characterized by further comprising

a unit accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame such that a next data frame is assigned to one of said transmission media that has a smallest data size of assigned data frames until a total data size reaches a largest size not exceeding the maximum data size Dmax, thereby generating the data series.

(37) The wireless packet communication apparatus according to Claim 31, characterized in that

the data series are generated by employing one of the units recited in claims 34 to 36 so that a total number of accommodated data frames is to be a maximum.

(38) The wireless packet communication apparatus according to Claim 32, characterized by further comprising

a unit accepting data frames to be transmitted in order and assigning the data frames to said transmission media until a total data size reaches a largest size not exceeding the maximum data size Dmax, thereby generating the data series.

(39) The wireless packet communication apparatus according to Claim 32, characterized by further comprising

a unit accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, and repeating the assignment of one data frame until a total data size reaches a largest size not exceeding the maximum data size Dmax, thereby generating the data series.

(40) The wireless packet communication apparatus according to Claim 32, characterized by further comprising

a unit accepting data frames to be transmitted in order, assigning one data frame to each of said transmission media, repeating the assignment of one data frame such that a next data frame is assigned to one of said transmission media that has a smallest data size of assigned data frames until a total data size reaches a largest size not exceeding the maximum data size Dmax, thereby generating the data series.

(41) The wireless packet communication apparatus according to Claim 32, characterized in that

the data series are generated by employing one of the units recited in claims 38 to 40 so that a total number of accommodated data frames is to be a maximum.

(42) The wireless packet communication apparatus according to Claim 31 or 32, characterized in that

said data series are generated to contain sub-headers for identifying said data

frames, respectively.

(43) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising

when transmission rates of respective transmission media for transmitting said X data packets simultaneously are the same and a maximum data size of said data packets is Dmax,

a unit generating X data packets by the unit recited in claim 27, in a case where a number of data frames to be transmitted is 1;

a unit generating X data packets by the unit recited in claim 29 or 31, in a case where a number of data frames to be transmitted is 2 or more and it is possible to generate data packets equal to or smaller than a maximum data size in each line by the connection and division as recited in claim 29 or the aggregation as recited in claim 31; and

a unit generating X data packets by the unit recited in claim 27, in a case where a number of data frames to be transmitted is 2 or more and it is impossible to generate the data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 29 or the aggregation as recited in claim 31.

(44) A wireless packet communication apparatus for transmitting X data packets simultaneously between two STAs by using a plurality of radio channels determined to be idle by carrier sense and/or a radio channel determined to be idle and MIMO, X corresponding to a total number of MIMOs of the plurality of radio channels determined to be idle, the wireless packet communication apparatus characterized by comprising:

when it is possible to independently set transmission rates of respective

transmission media for transmitting said X data packets simultaneously and when a largest one of the transmission rates of said respective transmission media is a reference transmission rate,

a unit setting a maximum data size of said X data packets to a value obtained by (Dmax × a transmission rate of a corresponding line/the reference transmission rate);

a unit generating X data packets by the unit recited in claim 28, in a case where a number of data frames to be transmitted is 1;

a unit generating X data packets by the unit recited in claim 30 or 32, in a case where a number of data frames to be transmitted is 2 or more and it is possible to generate data packets equal to or smaller than a maximum data size in each line by the connection and division as recited in claim 30 or the aggregation as recited in claim 32; and

a unit generating X data packets by the unit recited in claim 28, in a case where a number of data frames to be transmitted is 2 or more and it is impossible to generate the data packets equal to or smaller than the maximum data size in each line by the connection and division as recited in claim 30 or aggregation as recited in claim 32.

(45) The wireless packet communication apparatus according to Claim 27 or 28, characterized in that

X data packets generated after the simultaneous transmission of the X data packets are transmitted continuously without performing carrier sense, until a time corresponding to a transmission time of data packets generated from said one data frame before being fragmented passes.

(46) The wireless packet communication apparatus according to Claim 27 or 28, characterized in that

X data packets generated after the simultaneous transmission of the X data packets are transmitted simultaneously consecutively X times without performing carrier sense.

(47) The wireless packet communication apparatus according to any one of Claims 27 to 32, characterized in that

when one of said two STAs is an AP and the other is a mobile terminal,

the wireless packet communication apparatus selects data frames from data frames addressed to a same mobile terminal in a transmission buffer of said AP within a range in which the selected data frames are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing data frames transmitted to said mobile terminal from a device connected to said AP; adds a source address of the device connected to said AP to each of frame bodies of the selected data frames and connects the frame bodies; adds a MAC header to each of data blocks obtained by dividing the connected frame bodies by a number of simultaneous transmissions to generate said X data packets; and transmits said X data packets simultaneously.

(48) The wireless communication apparatus according to any one of Claims 27 to 32, characterized in that

when one of said two STAs is an AP and the other is a mobile terminal,

the wireless packet communication apparatus selects IP packets from IP packets addressed to a same AP in a transmission buffer of said mobile terminal within a range in which the selected IP packets are able to be accommodated in data packets to be transmitted simultaneously, the transmission buffer storing IP packets to be transmitted to a device connected to said AP; adds a destination address of the device connected to said AP to each of the selected IP packets and connects the IP packets; generates said X data packets by adding a MAC header to each of data blocks obtained by dividing the connected frame bodies by a number of simultaneous transmissions; and transmits said X data packets simultaneously.

(49) The wireless packet communication apparatus according to any one of Claims 27 to

32, characterized in that

when one of said two STAs is an AP and the other is a mobile terminal,

the wireless packet communication apparatus selects and aggregates data frames from data frames addressed to a same mobile terminal in a transmission buffer of said AP within a range in which the aggregated data frames are able to be accommodated in respective data packets to be transmitted simultaneously, the transmission buffer storing data frames transmitted to said mobile terminal from a device connected to said AP; adds a source address of the device connected to said AP to each of frame bodies of the selected data frames and further adds a MAC header to each of the frame bodies of the selected data frames to generate said X data packets; and transmits said X data packets simultaneously.

(50) The wireless packet communication apparatus according to any one of Claims 27 to 32, characterized in that

when one of said two STAs is an AP and the other is a mobile terminal,

the wireless packet communication apparatus selects and aggregates IP packets from IP packets addressed to a same AP in a transmission buffer of said mobile terminal within a range in which the selected IP packets are able to be accommodated in respective data packets to be transmitted simultaneously, the transmission buffer storing IP packets to a device connected to said AP; adds a destination address of the device connected to said AP to each of the selected IP packets and further adds a MAC header to each of the selected IP packets to generate said X data packets; and transmits said X data packets simultaneously.

(51) The wireless packet communication apparatus according to any one of Claims 27 to 32, characterized in that

when one of said two STAs transfers data frames accumulated in a transmission buffer to the other STA, for data frames addressed to the other STA, the one STA generates

data packets by the unit recited in any one of claims 47 to 50 and transmits the data packets in one lump or simultaneously.

(52) The wireless packet communication apparatus according to any one of Claims 27 to 32, characterized in that

a communication device is connected to each of said two STAs; and

when one of said two STAs transfers data frames that are accumulated in a transmission buffer and are transmitted from a source device connected to the one STA to a destination device connected to the other STA, for data frames addressed to the other STA, the one STA generates data packets by the unit recited in any one of claims 47 to 50 and transmits the data packets in one lump or simultaneously.